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Mutant Sinistrality in the Polygyridae; an Update

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The terrestrial pulmonate family Polygyridae is the most speciose and widespread such group in North America, occurring in 45 of the 49 continental states of the USA, stretching into Canada and Mexico and straggling into the outskirts of Central America and the West Indies. Thus defined, the family conforms with remarkable precision to the political boundaries of North America as any natural lineage of organisms ever has – and from the late Cretaceous Period (Pilsbry, 1940).

The metropolis of the family is east of the American Rockies, where 18 (15 endemic) of its two dozen genera occur (Schileyko, 2006), generally prospering in humid deciduous forests. These 140-odd species constitute over one quarter of the eastern US landsnails (Hubricht,

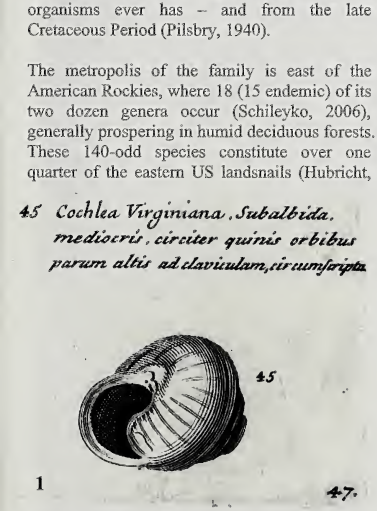

Figure 1. *Neohelix albolabris* (Say, 1817)

1985). Because of their size (adults 5-45 mm; median ~15 mm), diversity, elaboration of the aperture, and general eye-pleasing form, polygyrids caught the fancy of collectors (*e.g.*, M. Lister *et al.*, 1685,[1] our Figure 1) well before its first 3 species were formally described by the America's founding conchologist, Thomas Say (1817).

The special attention given these snails has led to more efficient detection and better preservation of specimens, including unusual ones. Reversal of gastropod chirality has been noted for centuries in the conchological literature, and it happens to fascinate the writer. Terrestrial pulmonates, more specifically the Stylommatophora, have a much higher frequency of mutant reversal of coil than do any other snail group, and it is no surprise that the polygyrid species are prominent among this worldwide lineage. Lee (2011a) assembled records of reverse-coiled polygyrids (all from the eastern USA) for about 53 specimens of 23 species in 15 genera. Since then several more have come to light, most actually collected after the publication appeared. The following account is an attempt to update the tally and analyze the data. The new records are presented in alphabetical (genus, then species), thus, and otherwise, in conformation with the format in Lee (2011a)

(1), (2) ***Mesodon clausus*** **(Say, 1821)** Circleville, Pickaway Co., OH, Joseph Lewis! December, 1899, CM 82070; Antioch, Jackson Co., TN, Bob Winters! April 9, 2015, Winters Collection (Winters, 2015b); Figure **2**: 17 mm

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Figure 2. *Mesodon clausus* (Say, 1821) .

Figure 3. *Polygyra cereolus* (Mühlfeld, 1818)

Figure 4. *Triodopsis fallax* (Say, 1825)

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(3) ***Polygyra cereolus*** **(Mühlfeld, 1818)** Hastings, St. Johns Co., FL, H.G. Lee! April 23, 2006. Lee Collection (Lee, 2012); Figure **3**: 7 mm.

(4)***Triodopsis fallax*** **(Say, 1825)** Lexington, Rockbridge Co., VA, Mrs. K.C. Brooke! Oct. 15, 1901, CM 97968: Figure **4**: 13 mm.

(5) ***Triodopsis hopetonensis*** **(Shuttleworth, 1852)** Residence, Woodleaf Court, Charleston, SC, Tom Smith! 29 August, 2009, Smith Collection; ~10 mm.

4a

Figure 4a. ***Triodopsis hopetonensis*** **(Shuttleworth, 1852)**

Figure 5. ***Triodopsis juxtidens*** **(Pilsbry, 1894)**

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(6), (7) ***Triodopsis juxtidens*** **(Pilsbry, 1894)** Stanardsville, Green Co., VA, John Slapcinsky! 1988. FMNH 279499; residence, Powell's Landing Circle, Woodbridge, Prince William County, VA, Tom Smith! 8 February, 2015, Smith Collection; Figure **5**: ~ 13mm.

(8) ***Triodopsis messana*** **Hubricht, 1953** Jacksonville, Duval Co., FL, Bill Frank! 16 July, 2015, Frank Collection ([Lee], 2015); Figure **6**: 13 mm.

Figure 6. ***Triodopsis messana*** **Hubricht, 1953**

Figure 7. ***Triodopsis vulgata*** **Pilsbry, 1940**

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(9) ***Triodopsis vulgata*** **Pilsbry, 1940** Bernheim Forest, Nelson Co., KY, H.G. Lee! Lee Collection; Figure 7:15 mm.

(10) ***Triodopsis*** **species ["Florida Scrub Threetooth," an apparently unnamed taxon]** Camp Blanding, Clay Co., Florida. Bill Frank! 14 December, 2013, Frank Collection; Figure **8**: 15 mm.

Figure 8. ***Triodopsis*** **species ["Florida Scrub Threetooth," an apparently unnamed taxon]**

Figure 9. ***Xolotrema obstrictum*** **(Say, 1821)**

(11) ***Xolotrema obstrictum*** **(Say, 1821)** Drift, confluence Estill and Larkin Forks, Jackson Co., AL, Bob Winters! March 17, 2015, Winters Collection (Winters, 2015a); Figures **9**, **10**: 22 mm.

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Figure 10. ***Xolotrema obstrictum*** **(Say, 1821)**

After integration of the above data with Lee (2011), the current sinistral polygyrid breakdown is: 15 genera (no change), 27 species (4 addenda), about 64 specimens (11 addenda), and twenty-five attributed collectors (with the **five new pantheon inductees**) found 47 of the approximately 64 known specimens:

Archer, A.F. **3**
Baily, R.I. **1**
Binney, W.G. **1**
Brooke, (Mrs.) K.C. 1
Bryant, F.W. **1**
Feinberg, H.S. **1**
Fluck, W.H. **2**
Frank, W. 2
Hubricht, L. **11**
Lee, H.G. **3** [up 2]
Lewis, J(ames). **1**
Lewis, J(oseph) 1
Marsh, P. (?) **2**
Mehring, A.L. **1**
Pratt, W.L. **1**
Schilling, F. **1**
Singley, J.A. **1**
Slapcinsky, J. **2** [up 1]
Smith, T. 2
Stannage **1**
Sullivan, W. **1**
Thompson, F.G. **1**
Webb, G.R. **1**
Wetherby, A.G. **3**
Winters, B. 2

Considering the above images, the fact that 15 of the 18 genera and 27 of the 140 species occurring in the eastern USA are now represented on the list, and that those 27 are among the more familiar, widespread, and frequently represented in collections, I think it quite reasonable to make the following generalizations with regard to mutant sinistral coil in the Polygyridae:

- phenomenon is quite thinly, but evenly spread over a broad phylogenetic and zoogeographic span within the family; and
- its occurrence correlates rather well with number of specimens made available for study.

Thus it's not so much the species selected than the number of individuals examined that will foster success in this game against long odds, and, with such limited prospects:

- the successful player holds the hand he's dealt. In this game, restrain ambitions and be happy with less, often a lot less, than

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"gem" quality. These shells don't last forever in nature.

[1] *Cochlea virginiana* of the Listers (Martin and artist daughters Anna and Susanna) is almost certainly a synonym of *Helix albolabris*, now *Neohelix albolabris* (Say, 1817). The polymath Englishman Dr. Martin Lister (1639-1712), physician to Queen Anne, was in correspondence with Rev. John Banister (ca.1650-1692), an English colonist who was Oxford-educated in natural science. Aside from ministering to an Anglican parish, he collected plants and shells in tidewater Virginia and was a founder of the College of William and Mary, located near his Charles City home. Banister is known to have sent the regal doctor field-collected material (Ewan and Ewan, 1970: xxi, *passim*).

Abbreviations employed:
CM: Carnegie Museum of Natural History, Pittsburgh, PA
FMNH: Field Museum of Natural History, Chicago, IL

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APPENDIX (summary from Lee, 2011a: 10):

***Allogona profunda* (Say, 1821)** [Pilsbry, 1940: 879: Shimek and Billups have recorded 4 (no reference)] **(4)**
***Daedalochila avara* (Say, 1818)** [4132 Ortega Forest Dr., Jacksonville, FL, H.G. Lee! 27 July, 1977; Lee Collection] **(Fig. 9) (1)**
***Euchemotrema leai* (A. Binney, 1841)** [Archer, 1934: 148: Ann Arbor, MI, Alan F. Archer! 1932-1933] **(1)**
***Inflectarius inflectus* (Say, 1821)** [Bland, 1861: 448: John Gould Anthony Collection, ?MCZ; Pilsbry, 1940: 773: Hubricht! St. Louis, MO; FMNH; Feinberg, 1970: 12-13: Carter Co., TN, Harold S. Feinberg! 4 June, 1969, AMNH 57293] **(3)**
***Linisca texasiana* (Moricand, 1833)** [Hubricht, 1978: three, FMNH] **(3)**
***Mesodon clausus* (Say, 1821)** [Hubricht, 1978: immature; FMNH; Houston, TX, A.L. Mehring! 13 December, 1960. Gettleman Collection] **(2)**
***Mesodon elevatus* (Say, 1821)** [Tryon 1867: 104: Frank Daulte Collection, Cincinnati] **(1)**
***Mesodon mitchellianus* (I. Lea, 1839)** [Bland, 1861: 448: Thomas Bland Collection, ?AMNH but not in Gratacap (1901); Wetherby, 1895: 94: near Cincinnati, OH, F.W. Bryant!] **(2?)**
***Mesodon thyroidus* (Say, 1817)** [Bland, 1861: 448: Bland Collection, ?AMNH but not in Gratacap (1901); Wetherby, 1895: 94: three shells: one Cincinnati, OH, Stannage! two Wetherby! one deposited at MCZ; Archer, 1934: 148-149; two specimens, Ann Arbor MI, A.F. Archer! April, May, 1933; Petit, R.E., March, 2007, personal communication, G.R. Webb letter to P.H. Reed late Sept. or early Oct., 1946, prob. FMNH] **(8?)**
***Mesodon zaletus* (A. Binney, 1837)** [Pilsbry, 1940: 725: two specimens: one Herkimer Co, NY, one ANSP; Fluck, 1943: 105: two of several hundred individuals, Ilion, Herkimer Co., NY, W.H. Fluck!] N.B. Ilion colony introduced by James Lewis (*fide* A. Bailey, Pilsbry, 1940: 724-725), therefore derived from dextral stock. **(3-4?)**
***Millerelix mooreana* (W.G. Binney, 1857)** [Pilsbry, 1940: 624: J.A. Singley!] **(1)**
***Neohelix albolabris* (Say, 1817)** [Lewis, 1872: 99: near Mohawk, NY, James Lewis! June, 1871; Pilsbry, 1940: 838: several known; Reigle, 1962: 37; Washtenaw Co., MI, Phil Marsh(?)!; UMMZ 210163] **(prob. >6)**
***Patera roemeri* (L. Pfeiffer, 1848)** [Pratt, 1965: Possum Kingdom S.P., Palo Pinto Co., TX, W(illiam) Lloyd Pratt! (?)1965, Pratt Collection no. 992] **(1)**
***Polygyra cereolus* (Mühlfeld, 1818)** [Baily, 1942: 102: Hillsboro, FL, R.I. Baily! Spring 1940; Sullivan, 1986: Desoto Park, Manatee Co., FL, Wayne Sullivan! 1986] **(Fig. 10)] (2)**
***Polygyra septemvolva* Say, 1818** [W.G. Binney, 1878: 282 MCZ; Waccasassa River, SR 24 bridge, Levy Co., Florida, John Slapcinsky! 19 March, 2005, Lee Collection] **(Fig. 11) (2)**
***Praticolella* species** [23 km NNW El Limon, Tamaulipas, Mexico, Fred G. Thompson! 27 December, 1989, Lee Collection] **(Fig. 12) (1)**
***Stenotrema hirsutum* (Say, 1817)** [Bland, 1961: 448: Isaac Lea Collection, ?USNM] **(1)**
***Triodopsis fallax* (Say, 1825)** [Bland, 1861: 448: William Greene Binney Collection, ?AMNH but not in Gratacap (1901); Hubricht, 1978: two, FMNH] **(3)**
***Triodopsis hopetonensis* (Shuttleworth, 1852)** [Pilsbry, 1940: 812: ANSP; Hubricht, 1978, FMNH] **(2)**
***Triodopsis obsoleta* (Pilsbry, 1894)** [Hubricht, 1978: three, FMNH] **(3)**
***Triodopsis vulgata* Pilsbry, 1940** [Reigle, 1962:36-37: Washtenaw Co., MI, Phil Marsh(?)!, UMMZ 210162] **(1)**
***Webbhelix multilineatus* (Say, 1821)** [Wetherby, 1895: 94: A.G. Wetherby! MCZ] **(1)**
***Xolotrema fosteri* (F.C. Baker, 1932)** [Pilsbry, 1940: 831: W.G. Binney! 202 Union St., Burlington, NJ (his own garden), ?AMNH, but not in Gratacap (1901); St. Louis, MO, Frieda Schilling! 2 May, 1969, Lee Collection] N.B. NJ specimen definitely derived from (naturalized) dextral stock. **(Fig. 13) (2)**
Total: 15 genera, 23 species, about (53) **specimens.** Twenty attributed collectors took **36 of the approximately 64 known specimens.**